Plant and Soil Science & Technology, Advanced

Levels: Grades 11-12
Units of Credit: Year (1.0)
CIP Code: 020421
Prerequisite: Plant and Soil Science & Technology
Biology-Agricultural Science and Technology or Biology

COURSE DESCRIPTION

Students will be introduced to range resource management. They will be exposed to the importance of integrating biotechnology into crop production. They will also learn to identify common weed, disease, and insect pests.

CORE STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD
020241-01 Students will develop an understanding of the role of FFA in Agricultural Education Programs.

OBJECTIVES

020421-0101 Students will explain FFA officer duties and responsibilities.

- Students will describe the duties and responsibilities of chapter FFA officers.
- Students will explain the proper dress and characteristics of a good FFA leader.

020421-0102 Students will Plan and organize an FFA meeting.

- Students will explain how to plan a meeting and develop the order of business.
- Students will describe how to set up the meeting room.
- Students will explain the parliamentary procedure used in an FFA meeting.

STANDARD
020421-02 Students will understand the benefits of a Supervised Agricultural Experience (SAE) Program.

OBJECTIVES

020421-0201 Students will keep and use SAE records.

- Students will explain how SAE records are organized.
- Students will identify the procedures to making entries in the SAE records.
- Students will explain how to summarize and analyze the SAE records.

020421-0202 Students will make long range plans for expanding SAE Programs.

- Students will identify the factors that should be considered in expanding an SAE program.
- Students will explain how placement and ownership SAE programs may be expanded.

STANDARD
020421-03 Students will demonstrate an understanding of range resources and management.

OBJECTIVES

020421-0301 Students will evaluate range management systems, economics, and improvement techniques.

020421-0302 Students will determine livestock and wildlife use on rangeland.

020421-0303 Students will describe range management practices related to plant growth and development.

020421-0304 Students will establish a range transect and use it to evaluate a specific location.

STANDARD
020421-04 Students will manage plant pests - weeds, diseases, and insects.

OBJECTIVES

020421-0401 Students will identify plant pests, diseases and their causes.

- Students will identify and describe types of pests.
- Students will describe the classification of plant diseases.
- Students will explain the identification of weeds.
- Students will explain the classification of and identify insects and nematodes.

020421-0402 Students will identify and select an appropriate control for each major type of pest.

- Students will describe types of pest control strategies.
- Students will explain the identification, diagnosis, and control of plant diseases.
- Students will describe methods of weed management and the selection of herbicides.
- Students will describe methods of insect and nematode management.

020421-0403 Students will describe the principles of pest management.

- Students will explain Integrated Pest Management (IPM)
- Students will identify benefits of IPM.
- Students will explain scouting of field crops for pests.
- Students will identify basic principles of crop monitoring.
- Students will identify strategies used in disease management.

020421-0404 Students will prepare plant and soil samples for analysis.

- Students will describe why, how, and when to conduct soil samples.
- Students will interpret the results of soil analysis.
- Students will explain samples and sampling techniques used with monitoring field crops.

020421-0405 Students will understand the importance of pesticide safety.

- Students will identify major classifications of pesticides and their use.
- Students will identify the safety practices that should be followed when applying pesticides.
- Students will properly interpret pesticide labels.
- Students will explain how to properly calibrate equipment used in applying pesticides.
- Students will identify the environmental concerns involved with pesticide use.
- Students will explain proper disposal of surplus pesticides and empty containers.

STANDARD

020421-05 Students will integrate principles of biotechnology into plant science.

OBJECTIVES

020421-0501 Students will design and conduct experiments to support known principles of genetics.

020421-0502 Students will explain basic plant physiology and reproduction as it relates to biotechnology.

- Students will discuss and identify the various methods of stem cutting propagation.
- Students will discuss the methods of leaf and leaf-bud cuttings.
- Students will describe the various types of growing media used for cuttings.
- Students will describe grafting and identify three common methods.
- Students will explain layering and the difference between separation and division in plant propagation.
- Students will explain tissue culture.
- Students will discuss the importance of tissue culture.
- Students will discuss a tissue culture methods of propagation used in the greenhouse industry.
- Explain various molecular biotechnology methods.

020421-0503 Students will explain the regulatory aspects of biotechnology.

020421-0504 Students will discuss ethical issues in modern biotechnology.